MODELS CM2 AND CM4

INTERFACE MODULES

USER'S MANUAL



MODEL CM2



MODEL CM4

Parker | PORTER

Parker Hannifin Corporation
Porter Instrument Division
245 Township Line Rd.
P.O. Box 907
Hatfield, PA 19440-0907 USA
(215) 723-4000 / fax (215) 723-2199

FM-264 Rev. H 8/07

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PRODUCT DESCRIPTION

Porter's Interface Modules Models CM2 and CM4 are designed for use with all Porter Instrument Series 100 Mass Flowmeters (MFM's) and Series 200 Mass Flow Controllers (MFC's). Model CM2 employs two (2) channels, accepting flow signal inputs and providing setpoint control for each channel. Model CM4 includes four (4) flow signal input channels and likewise has a setpoint control for each channel. Process flow rates for all channels are displayed on a large, bright, red digital panel meter as a percentage of full scale (F.S.). The range of this meter is from 000.0 to 102.4 percent. Setpoints for any channel may also be displayed on the digital panel meter in the same percentage of full scale flow units. Setpoints are adjustable to any value in the previously stated range using the ten (10)-turn adjustment controls.

Control action occurs when the process flow value in a given channel matches its respective setpoint. Both models also feature Automatic Proportional Tracking (APT) Mode operation. APT operation permits setting the flow rate control in one or more channels to be a fixed ratio of the flow rate control in a reference channel, regardless of the process flow rate in that reference channel.

Models CM2 and CM4 are completely self-contained with internal modular construction. Although they are multi-featured instruments, their operation is extremely simple.

Specifications

Function: Processes 0 to 5 Vdc flow signal inputs from Series 100 MFM's and Series 200 MFC's to provide readout in percentage of full scale (F.S.) flow. For Series 200 MFC's, provides 0 to 5 Vdc setpoint control outputs.

Inputs: Model CM2: Two (2) channels.
Model CM4: Four (4) channels.

Inputs (flow signal line plus common) enter instrument via 15-pin D-type connectors CH1, CH2, CH3 (Model CM4 only) and CH4 (Model CM4 only) on rear panel.

Setpoints: One (1) setpoint potentiometer per channel, adjustable from 0 to 102.4% F.S. with ten (10)-turn control.

Display: Red, 3½ digit (0.56 in. high) digital panel meter with 0.1% resolution.

Auxiliary (AUX) Outputs: Available for each channel at rear panel via 25-pin D-type AUX connector for remote output signal use.

Automatic Proportional Tracking (APT) Control: Control switches located on rear panel permit fixed internal reference for all setpoint channels or selected flow signal references for all setpoint channels except Channel 1.

Power Requirements: 117 Vac (± 10%), 50 to 60 Hz, 50 watts max. Line fuse (rear panel) is rated at 0.5A Slo-Blo.

Housing Style: Table-top mounting.

Dimensions: 8-1/2"W x 4-7/8"H x 9 3/4"D.

Weight: Model CM2: 6 lbs.
Model CM4: 6 lbs.

THEORY OF OPERATION

GENERAL INFORMATION

Flow signals from individual MFM's and/or MFC's are processed by Model CM2/CM4 for digital display of flow rates in percentage of full scale and, if user-selected, APT operation of MFC's. Model CM2/CM4 also provides a setpoint source required for MFC's. These functions are accomplished by four (4) modular circuit assemblies. These modules are designated as follows:

1. Power Supply Module
2. Signal Conditioning Module
3. Interconnect Module (includes interconnect PC board, rear panel and rear panel components).
4. Front Panel Module (includes digital panel meter, selector switches and setpoint controls).

POWER SUPPLY MODULE
(Refer to schematic # KB20000)

The Power Supply Module is comprised of a PC board and 'L'- shaped chassis which mounts to the PC board and off-board power transformer. The power supply provides three regulated supplies: +5 Vdc, +15 Vdc and -15 Vdc, plus a precise +5.120 Vdc reference supply. They operate all functional circuitry within the Model CM2/CM4. The +5 Vdc supply is specifically intended to power the digital panel meter.

The 117 Vac primary winding of power transformer X1 is fed from the power cord, ½ amp line fuse, ON/OFF switch and a pair of quick disconnect-type connectors J3-1 to J3-2.

The +5 Vdc three (3)- terminal regulator, U1 (LM340-5), receives its applied voltage from a full-wave rectifier/filter CR2, CR3 and C1. Capacitor C2 serves as a transient suppressor.

Regulators U2 and U3 (LM340 and LM320) form the basis for the dual +15 and -15 Vdc power supplies. The positively oriented rectifier diodes (part of CR5) apply their full-wave voltage to filter capacitor C3. Capacitor C6 acts to suppress transients. Note that the negatively oriented rectifier diodes (part of CR5) are the counterparts of those previously mentioned.

Likewise, capacitors C4 and C5 (in parallel) plus C7 are the counterparts of C3 and C6 respectively.

The regulator (U4), used to develop the precise reference voltage (5.120 Vdc), is a LM317LZ. Resistor R1 sets a value of current through R2 by virtue of the fixed voltage across it, as established by the output terminals of U4. The total voltage across R1 and R2 is approximately 5.12 volts. Adjustment potentiometer R4 and resistor R3 set the junction of R1 and R2 such that the final output voltage across the filter capacitor C8 is exactly 5.120 Vdc.

SIGNAL CONDITIONING MODULE
(Refer to schematic # KB19705)

The purpose of the Signal Conditioning Module is to multiplex (switch) up to four (4) input flow signals into a single (1) output meter signal. Setpoint signal levels are also available at the input of the multiplexer and may be selected for display on the digital panel meter.

Multiplexers U1 and U2 (type CD4051) electronically switch eight (8) analog signal inputs to a single (1) output. A three (3)-bit binary code applied to pins 9 through 11 determines which inputs are switched to the output. Flow signals are applied to the first four (4) inputs of U1. The common return lines for these flow signals are applied to four (4) inputs on U2. The four (4) setpoint signal levels are applied to the second (2nd) set of inputs on U1. They are also fed from this same location out to their respective MFC via connector 2J1, the interconnect PC board and channel input connectors 1J1 and 1J2 (Model CM2) and 1J1 through 1J4 (Model CM4).

The binary switching code for the IC multiplexers U1 and U2 is defined in Table 1. Keep in mind that switching code inputs C, B and A (pins 9, 10 and 11) relate to binary weighting columns 2^2, 2^1 and 2^0 respectively. Also remember the 'C' code input on IC U2 (pin 9) is connected directly to ground and is the only input which is not switched.

Examples of flow and setpoint selection are given following Table 1.

TABLE 1: SWITCHING CODE FOR IC MULTIPLEXERS U1 AND U2

	Channel No.	Binary Code C	B	A	IC Input Pin Selected
Setpoint and Flow Signal Common	1	0	0	0	13
	2	0	0	1	14
	3	0	1	0	15
	4	0	1	1	12
Flow Signal	1	1	0	0	1
	2	1	0	1	5
	3	1	1	0	2
	4	1	1	1	4

Assume a binary code of 110 is applied to the control input of U1. Since pin 9 is grounded on U2, its C, B and A code inputs would read 010. This means channel 3's flow signal and common return line are switched through to operational amplifier buffers U3A and U3B (LM324) respectively. Also note the control inputs for U1 and U2, which are not held low (zero volts) by the front panel CHANNEL SELECTOR switch connected via 2J6, are pulled high to Vcc (+12 Vdc) by resistors RN3-1, RN3-2 and RN3-3.

Depressing the FLOW/SETPOINT switch on the front panel activates (via pin 9 on U1) the second (2nd) group of signal levels applied to U1's inputs, namely the setpoint signals. The CHANNEL SELECTOR switch programs the channel desired to be displayed on the digital panel meter. For example, with the FLOW/SETPOINT switch not depressed and the CHANNEL SELECTOR switch set to CH1, IC U1's C, B and A code input will be 100, meaning the first flow signal and its common return are being selected. By depressing the FLOW/SETPOINT switch the code now becomes 000, causing the first setpoint to be selected. In other words, changing the binary 2^2 weighting column (Code C) from a '1' to a '0' switches the digital panel meter's display from flow signals to setpoint signals.

The 5 Vdc (maximum flow signal) at the output of unity gain buffer U3A is divided down to a 1 Vdc (maximum) signal by resistors R3 and R4. The common return line reference level for the flow signal is fed from unity gain buffer U3B to a resistor network consisting of R1, R2 and zero control R6. This control (R6) adjusts the common return line level to exactly zero (0) volts with no flow signal applied. Signals present between the two output lines are applied to the digital panel meter via connector 2J4.

Operational amplifier U3C serves as an inverting amplifier with a gain of X1 to convert its +5.12 Vdc input signal to a -5.12 Vdc output level. Both polarities of 5.12 Vdc are required for zero control R6. Operational amplifier U3D is connected as a unity gain buffer to apply a +12 Vdc level, divided down from +15 Vdc by resistors R5 and RN3-8, to CMOS multiplexers U1 and U2 as +Vcc. Connector 2J2 applies to the various power supply voltages to the signal conditioning PC board, which are carried through to connector 2J3, for application to field-located MFM's and/or MFC's.

INTERCONNECT MODULE
(Refer to schematic # KB19704)

All signals to and from the 'outside world' are made via the Interconnect Module. Therefore, consider this module as an input/output PC board with attached connectors and switches, mounted to the back panel.

Two (2) (Model CM2) or four (4) (Model CM4) sets of input/output signals are available on the 26-pin connector 1J6. Each set relates to a given channel. They include: 1) a 0 to 5 Vdc flow signal input, 2) its common return, 3) a setpoint signal output and 4) an auxiliary control input. Also note one (1) slide switch (Model CM2), SW1, or four (4) slide switches (Model CM4), SW1 through SW4, present in the schematic and located on the back panel. Further note that these switches allow the setpoint lines to be connected to the internal reference voltage (5.120 Vdc) or to the output signal of channel 1 (Models CM2 and CM4) or channel 3 (Model CM4 only). Channel 1 is always referenced to the internal 5.120 Vdc reference voltage. The possible combinations for referencing are as follows: CH2 to CH1, CH3 to CH1, CH4 to CH1 or CH4 to CH3 (the possible combinations involving channels 3 and 4 [CH3 and CH4] are available only with Model CM4). This arrangement relates to the APT mode control feature discussed in various sections of this user's manual.

The two (2) (Model CM2), 1J1 and 1J2, or four (4) (Model CM4), 1J1 through 1J4, individual channel input/output connectors located on the rear panel are designated CH1, CH2, CH3 (Model CM4 only) and CH4 (Model CM4 only). The individual channel input/output connectors connect to the previously mentioned 26-pin connector 1J6 via PC foils on the Interconnect PC board. The +15 Vdc and -15 Vdc supplies, along with the +5.120 Vdc reference voltage, enter the Interconnect PC board via connector 1J7 and exit via connectors 1J1, 1J2, 1J3 (Model CM4 only) and 1J4 (Model CM4 only).

Connector 1J5 is designated AUX and is mounted on the rear panel. It supplies 0 to 5 Vdc flow signals to external meters, recorders, etc., when required. The last items to be noted here are the ON/OFF power switch and power line FUSE, also located on the rear panel.

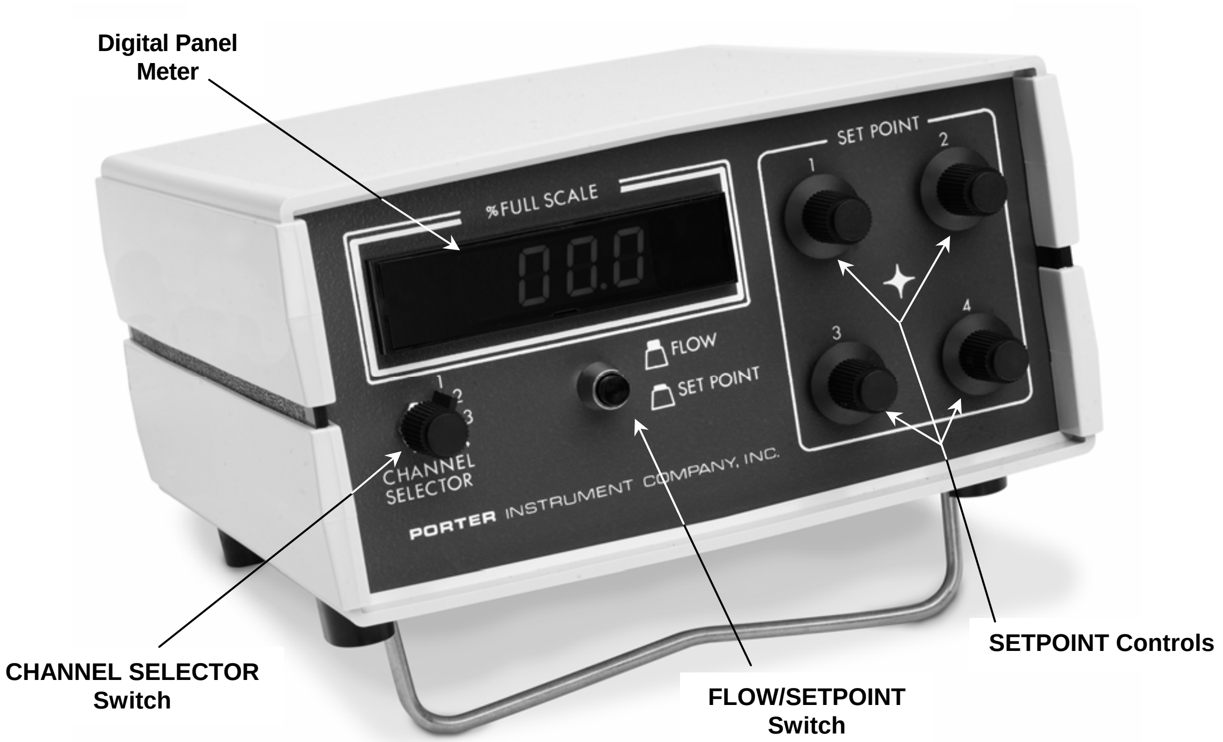
Note: The theory of any special control applications should be discussed with Porter Instrument's technical personnel.

FRONT PANEL MODULE
(Refer to schematic # KB19705)

The digital panel meter, CHANNEL SELECTOR switch, FLOW/SETPOINT switch and SETPOINT controls (CH1 & CH2 – Model CM2; CH1 through CH4 – Model CM4), along with their respective cable/connector assemblies, make up the Front Panel Module.

The actual range of the digital panel meter is 0 to 1.999 Vdc. Shifting the decimal point two (2) places to the right enables the meter to read 100.0% for a 1.000 Vdc flow signal input. The CHANNEL SELECTOR switch is a four (4)-position, two (2)-pole rotary switch which establishes a two (2)-column binary code (2^2 and 2^0) to program the appropriate coding inputs on IC U1 and U2 of the Signal Conditioning Module. The FLOW/SETPOINT push-button switch selects flow signals (binary 1 in the 2^2 column) or setpoint levels (binary 0 in the 2^2 column). Setpoint potentiometers are ten (10)-turn controls which provide a continuous 0 to 5.120 Vdc level to the inputs of IC U1 noted above, as well as the field-located MFC's. Keep in mind the 5.120 Vdc divided down 5:1 equals 1.024 Vdc, which in turn, equals a displayed value of 102.4% on the digital panel meter. Refer to the theory discussion on the Signal Conditioning Module for further details.

FIGURE 1: FRONT PANEL (MODEL CM4 SHOWN)



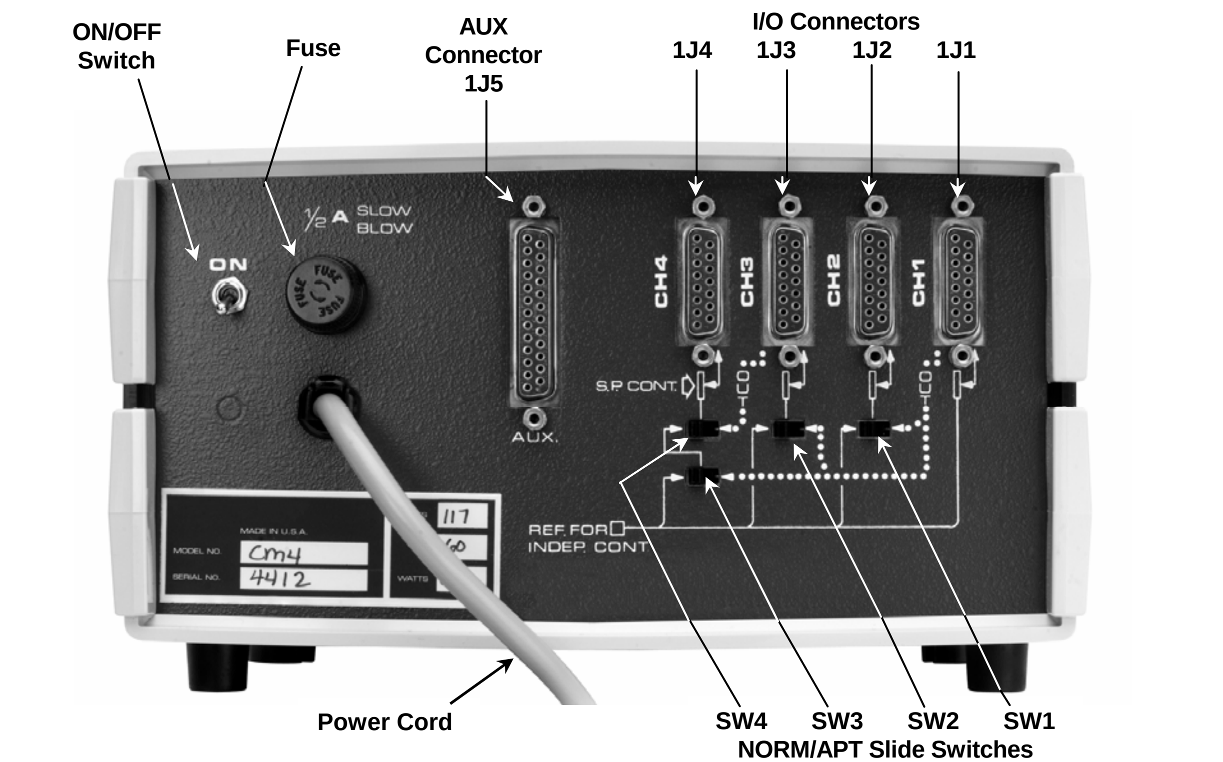


FIGURE 2: BACK PANEL (MODEL CM4 SHOWN)

OPERATION OF EQUIPMENT

GENERAL INFORMATION

As previously mentioned, Models CM2 and CM4 are used to provide a digital display of flow signals for Porter Instrument Series 100 MFM's, or to provide a digital display for both flow signals and setpoint controls for Porter Instrument Series 200 MFC's.

Control action of the Models CM2 and CM4 may take place in the Normal Mode or APT Mode. Normal mode occurs when the setpoint control in each channel is connected to a precise and fixed internal reference voltage. The SETPOINT control is then adjusted to a control point given as a percentage of full scale flow.

APT Mode occurs when one or more setpoint controls are connected, not to the internal reference voltage, but to a selected channel's flow signal output. This scheme permits automatic proportional blending of two (2) or more gases. In other words, if Channel 2's setpoint control is connected to Channel 1's flow signal output, then Channel 2's flow rate control becomes a fixed fractional ratio of Channel 1's flow rate, even if Channel 1's flow rate falls below its control limits.

NORMAL MODE OPERATION

Confirm the NORM/APT slide switches on the rear panel are set to the left side, to the solid line and reference arrows marked REF. FOR INDEP. CONT. Set the CHANNEL SELECTOR switch to the desired channel and read the digital panel meter for the process flow signal's percentage of full scale flow. Press the FLOW/SETPOINT switch located on the front panel and adjust the appropriate SETPOINT control until the desired setpoint value is displayed on the digital panel meter.

APT MODE OPERATION

Review the explanation offered for APT (Automatic Proportional Tracking) Mode operation given in the third paragraph under the heading titled "General Information" on this page. Position the selected NORM/APT slide switch(es) so that the channel(s) which is (are) to 'follow' or 'track' a given reference channel is (are) set to the right side, to the dotted line(s).

Table 2, found on the following page, indicates all APT combinations available. The Back Panel pictorial representation, located on the bottom of the previous page, illustrates the NORM/APT slide switches.

The important thing to remember when establishing APT Mode operation is to follow the dotted lines associated with the slide switches. These lines indicate which channel is 'tracking' a particular reference channel. Also note depressing the FLOW/SETPOINT push-button switch when the CHANNEL SELECTOR switch is set to display, the channel using APT Mode operation will now make the meter display the adjusted ratio of the reference channel's flow signal. That ratio is determined by the setting of the particular SETPOINT control switched into the APT Mode, and will be read on the meter as a percentage of a percentage.

TABLE 2: APT COMBINATIONS

CM2

Channel	
1	**2**
I	I
I	APT

CM4

Channel			
1	**2**	**3**	**4**
I	I	I	I
I	APT	I	I
I	APT	APT	I
I	APT	APT	APT
I	I	APT	I
I	I	APT	APT
I	I	I	APT
I	APT	I	APT
I	I	I	APT
I	APT	I	APT

NOTES:

1. I = Independent Control

2. APT = Automatic Proportional Tracking

<u>Example</u>: A Model CM2 is being operated in the APT Mode, with Channel 2 'tracking' Channel 1. Channel 1's SETPOINT Control is adjusted to 50.0 percent of full scale flow. Channel 2's SETPOINT Control is adjusted to 80.0 percent of Channel 1's controlled flow. This means Channel 2's flow rate should be controlled at 40 percent of full scale flow. In addition, for Model CM4, Channel 4 can track Channel 3 in the same manner. The major advantage of APT Mode operation in this case is even if the flow rate in Channel 1 falls below its control limits, Channel 2's flow rate will remain a fixed ratio or proportion (80 percent) of Channel 1's flow rate.

<u>VERIFICATION OF CALIBRATION</u>

Both Models CM2 and CM4 are shipped precisely calibrated and ready to use. If needed, the calibration can be confirmed using the digital panel meter. Proceed as follows: 1. Set the CHANNEL SELECTOR switch to CH1; 2. Rotate Channel 1's SETPOINT control fully clockwise; 3. Press the FLOW/SETPOINT push-button switch. The digital panel meter should display 102.4 percent.

<u>DIGITAL PANEL METER ADJUSTMENT</u>

If the digital panel meter reading obtained in the procedure above is not correct, you may assume the meter has 'drifted' slightly, since the reference supply, the basis for the equipment's calibration, is considered extremely accurate and stable (unless it is malfunctioning). Therefore, proceed as follows: 1. 'Pop' off the meter's red plastic filter/bezel. This can be done by placing a small, thin screwdriver blade under the recess at the bottom center of the filter/bezel. 2. With CHANNEL SELECTOR switch set to CH1 and Channel 1's SETPOINT control adjusted fully clockwise, depress the FLOW/SETPOINT push-button switch and maintain depressed. 3. Adjust the meter's calibration potentiometer, R14 (located to the right of the display digits), until the meter indicates 102.4%. 4. Replace filter/bezel.

<u>EQUIPMENT CALIBRATION</u>

This procedure should <u>not</u> be necessary, but may be conducted if there is reason to believe the equipment is, or may be, out of calibration. Calibration of Model CM2/CM4 simply means adjusting the +5.120 Vdc reference supply for +5.120 Vdc (±.002 Vdc). Proceed as follows: 1. Remove upper cover of the enclosure (housing). 2. Connect A/C power cord and turn unit on. 3. Locate the Channel 1's SETPOINT control on the back of the front panel module. Using a 4½- digit, .05% accurate digital voltmeter, connect the positive (red) test probe to terminal lug # 3 of the setpoint control and the negative (black) test probe to terminal lug # 1 of the setpoint control. 4. Locate potentiometer R4 on the 'L'-shaped power supply module (refer to Power Supply P.C. Board Assembly drawing # KB20001). Adjust potentiometer R4 until the voltmeter reads 5.120 Vdc (±.002 Vdc). 5. Perform 'Verification of Calibration' and 'Digital Panel Meter Adjustment'. Calibration is now complete.

TABLE 3: REAR PANEL CONNECTORS PIN FUNCTION

Connector # CH1 and CH2 (Model CM2)
Connector # CH1, CH2, CH3 and CH4 (Model CM4)

PIN NO.	FUNCTION
1	Cable Shield
2	0-5 Vdc Setpoint
3	Flow Signal Common
4	Circuit Common
5	Flow Signal Output
6	Circuit Common
7	+15 Vdc Power
8	No Connection
9	-15 Vdc Power
10-15	No Connection

Auxiliary (AUX) Connector

PIN NO.	FUNCTION	CHANNEL
1	Flow Signal Output	1
2	Flow Signal Common	1
3	Flow Signal Output	2
4	Flow Signal Common	2
5	Flow Signal Output	3
6	Flow Signal Common	3
7	Flow Signal Output	4
8	Flow Signal Common	4
9-25	No Connection	

POLICIES

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All prices are F.O.B. Hatfield, PA, and subject to change without notice. All merchandise will be invoiced at prices in effect at time of shipment. Prices do not include insurance, freight, taxes or special handling. These charges, if applicable, will be shown separately on invoice. Minimum order $30.00.

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Specifications and dimensions subject to change.

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No returns will be accepted unless authorized in writing by Porter Instrument Division and accompanied by a properly completed Returned Goods Authorization. All returns are subject to restocking and possible rework charges to be determined by Porter Instrument Division.

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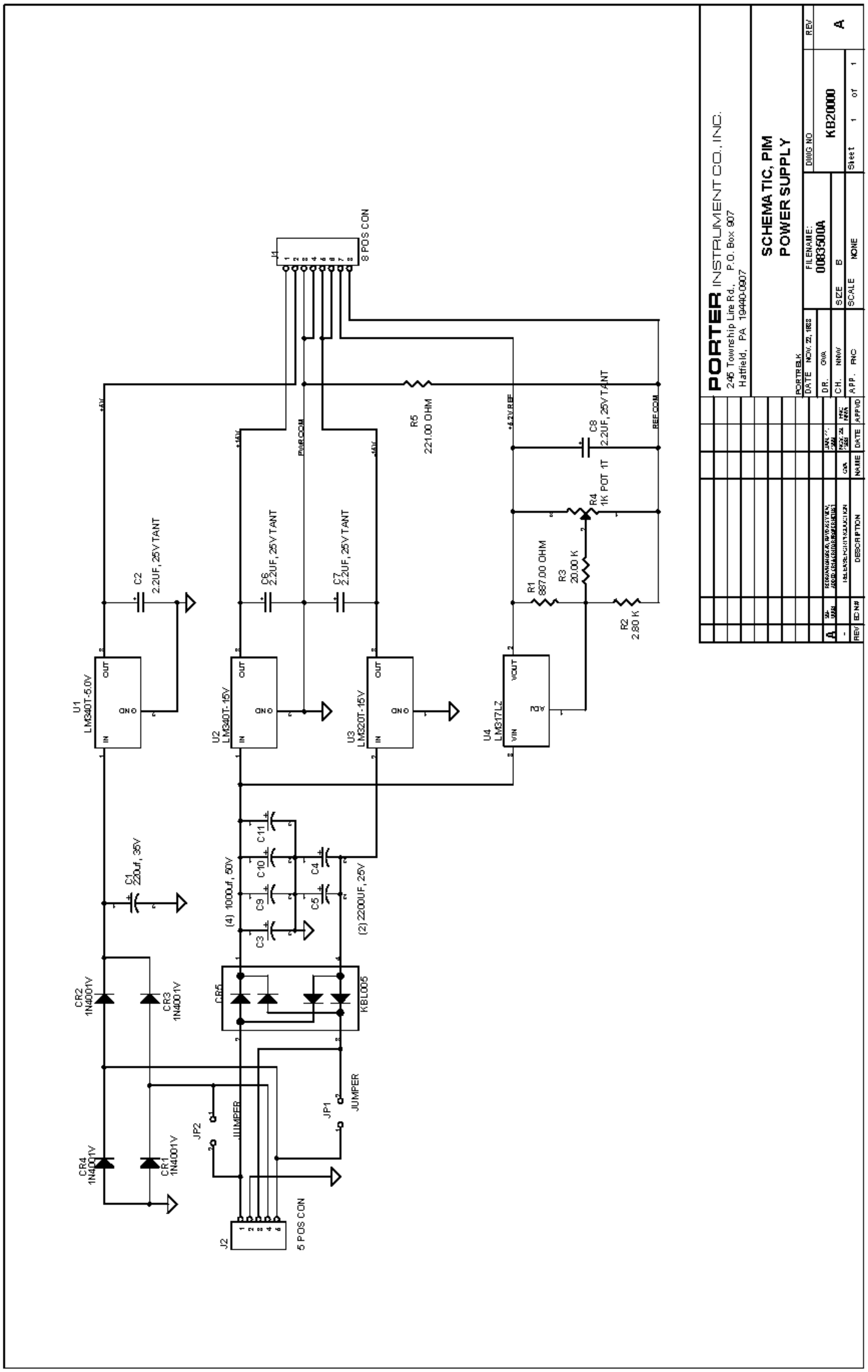
Parker Hannifin Corporation, Porter Instrument Division, warrants this equipment to be free from defects in workmanship and materials, when used in accordance with applicable specifications and with appropriate maintenance, for one (1) year from date of delivery to the customer, unless otherwise specified in writing.

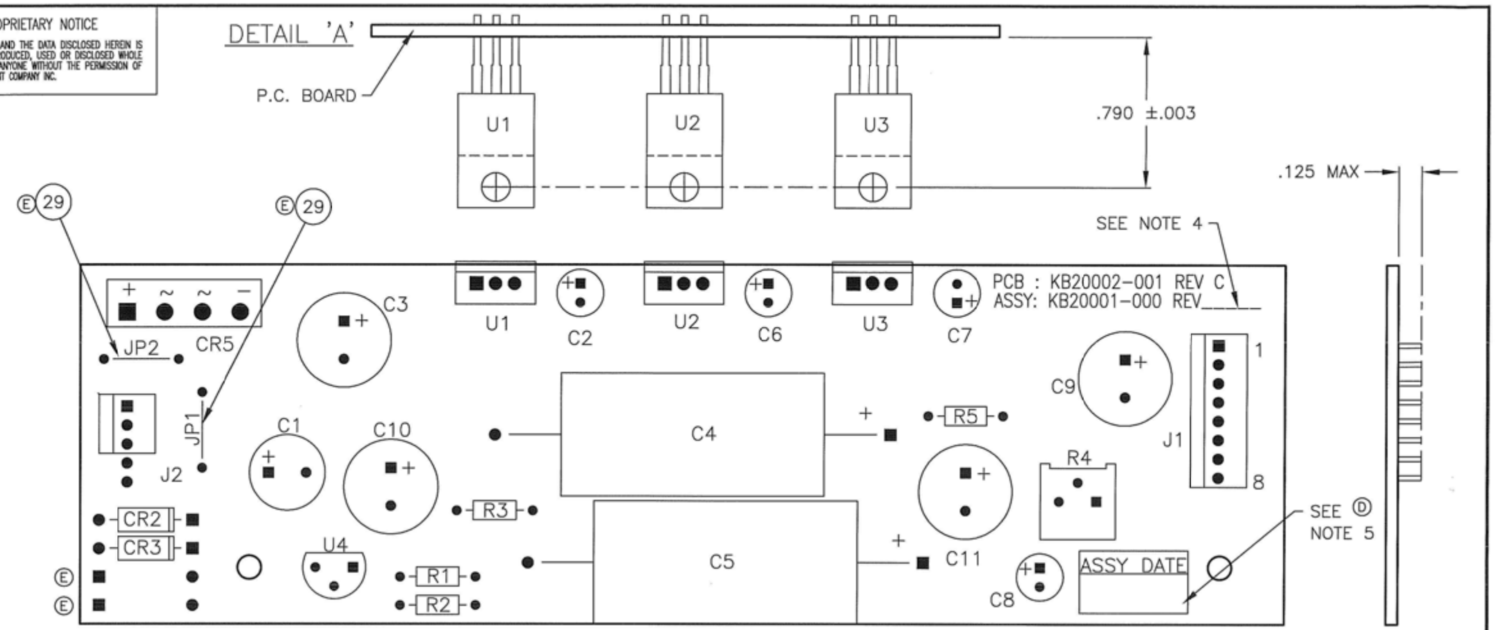
Equipment which malfunctions may be returned, shipment prepaid, to Parker Hannifin Corporation, Porter Instrument Division, for test and evaluation. Equipment determined to be defective and in warranty will be repaired or replaced at no charge to the customer. Equipment out of warranty will be evaluated, and if the equipment does not meet original specifications and calibration, the customer will be notified of the costs before proceeding with repair or replacement. Repaired equipment will be warranted ninety (90) days from date of delivery to the customer or for the balance of the original warranty, whichever is longer.

Failures due to shipping damage, accident, misuse, improper mechanical or electrical installation or operation, or internal clogging or corrosion due to use of contaminated fluids or inadequate system purging are excluded from warranty coverage.

Parker Hannifin Corporation's obligation for breach of this warranty, or for negligence or otherwise, shall be strictly and exclusively limited to the repair or replacement of the equipment. This warranty shall be void as to any equipment on which the serial number, if applicable, has been altered, defaced, or removed. Parker Hannifin Corporation shall under no circumstances be liable for incidental or consequential damages.

No other promise or statement about the equipment by any representative or authorized dealer of Parker Hannifin Corporation shall constitute a warranty by Parker Hannifin Corporation or give rise to any liability or obligation of Parker Hannifin Corporation.


PORTER INSTRUMENT CO., INC.
245 Township Line Rd., P.O. Box 907
Hatfield, PA 19440-0907
SCHEMATIC, PIM
POWER SUPPLY
FILENAME: 0083500A
DWG NO KB20000
REV A
SIZE B
SCALE NONE
Sheet 1 of 1
U1 LM340T-5.0V
U2 LM340T-15V
U3 LM320T-15V
U4 LM317LZ
C1 220uf, 35V
C2 2.2UF, 25V TANT
C6 2.2UF, 25V TANT
C7 2.2UF, 25V TANT
C8 2.2UF, 25V TANT
(4) 1000uf, 50V
(2) 2200UF, 25V
R1 887.00 OHM
R2 2.80 K
R3 20.00 K
R4 1K POT 1T
R5 221.00 OHM
CR1 1N4001V
CR2 1N4001V
CR3 1N4001V
CR4 1N4001V
CR5 KBL005
JP1 JUMPER
JP2 JUMPER
J1 8 POS CON
J2 5 POS CON



NOTES:

(E) 1.
(E) 2.
3. ASS'Y VIEWED FROM COMPONENT SIDE.
4. PERMANENTLY MARK REVISION LEVEL OF THIS DWG, IN SPACE GIVEN, USING WHITE EPOXY INK, CHARACTERS TO BE 1/16" HIGH, MIN.
(D) 5. PERMANENTLY MARK ASSY DATE IN SPACE GIVEN, USING WHITE EPOXY INK, CHARACTERS TO BE 1/16" HIGH, MIN.
(F) 6. USE FIXTURE EA-013 WHEN INSTALLING U1, U2, & U3.

REV	EC NO.	DESCRIPTION	NAME	DATE	APPVD
G	05-0348	SHT. 2: ITEM 11 WAS KA16752	MER	MAY 25, 2005	WHK BTON
F	04-0842	ADDED NOTE 6	MAM	OCT. 5, 2004	WHK FNC
E	99-0689	REMOVED ITEM 27 & 28; ADDED ITEM 29; REMOVED NOTES 1 & 2; CHANGED ITEM BUBBLES FOR ITEM 27 & 28 TO ITEM 29;REMOVED CR1 & CR4 FROM DWG	AEM	OCT. 21, 1999	FNC BTT

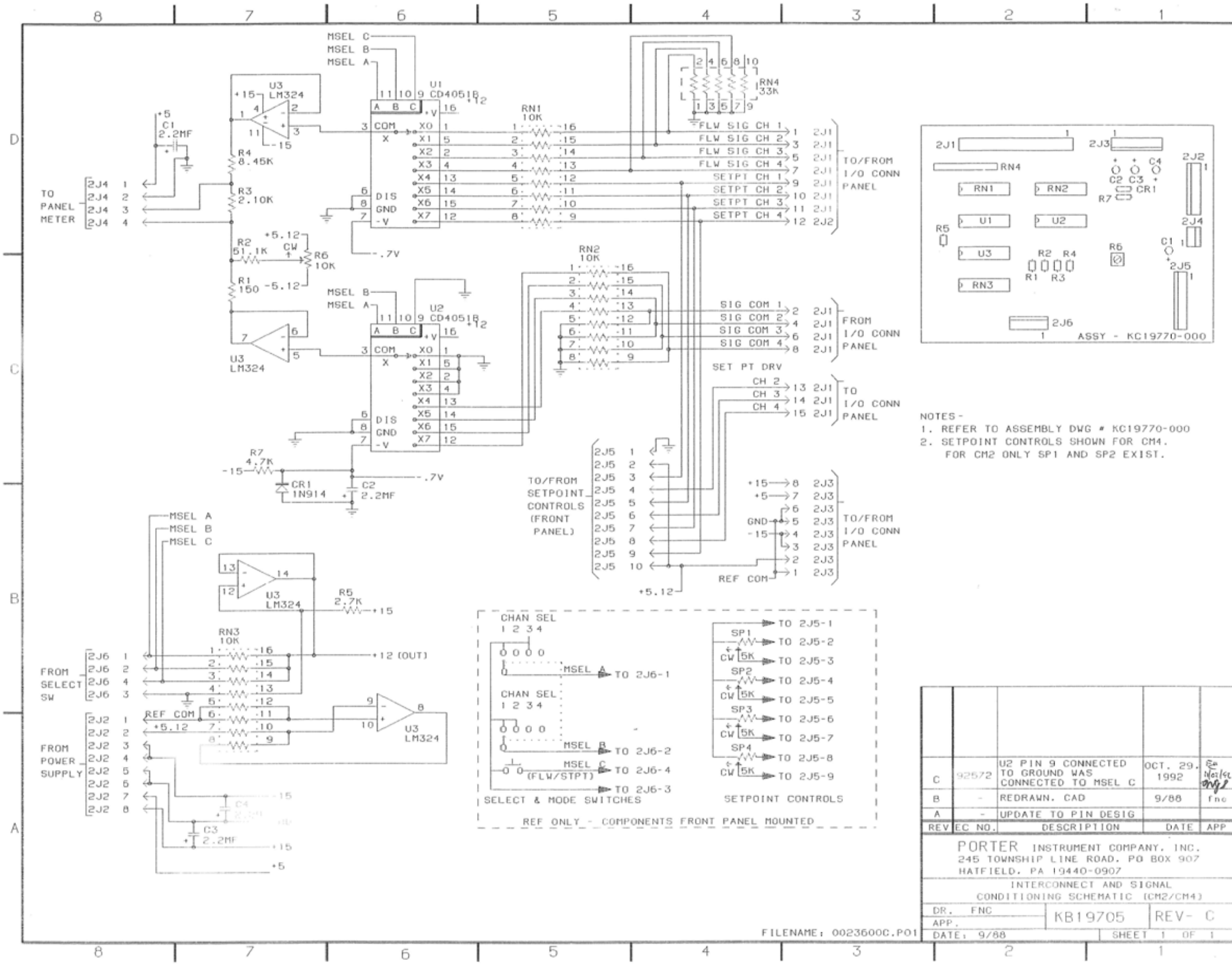
REVISIONS

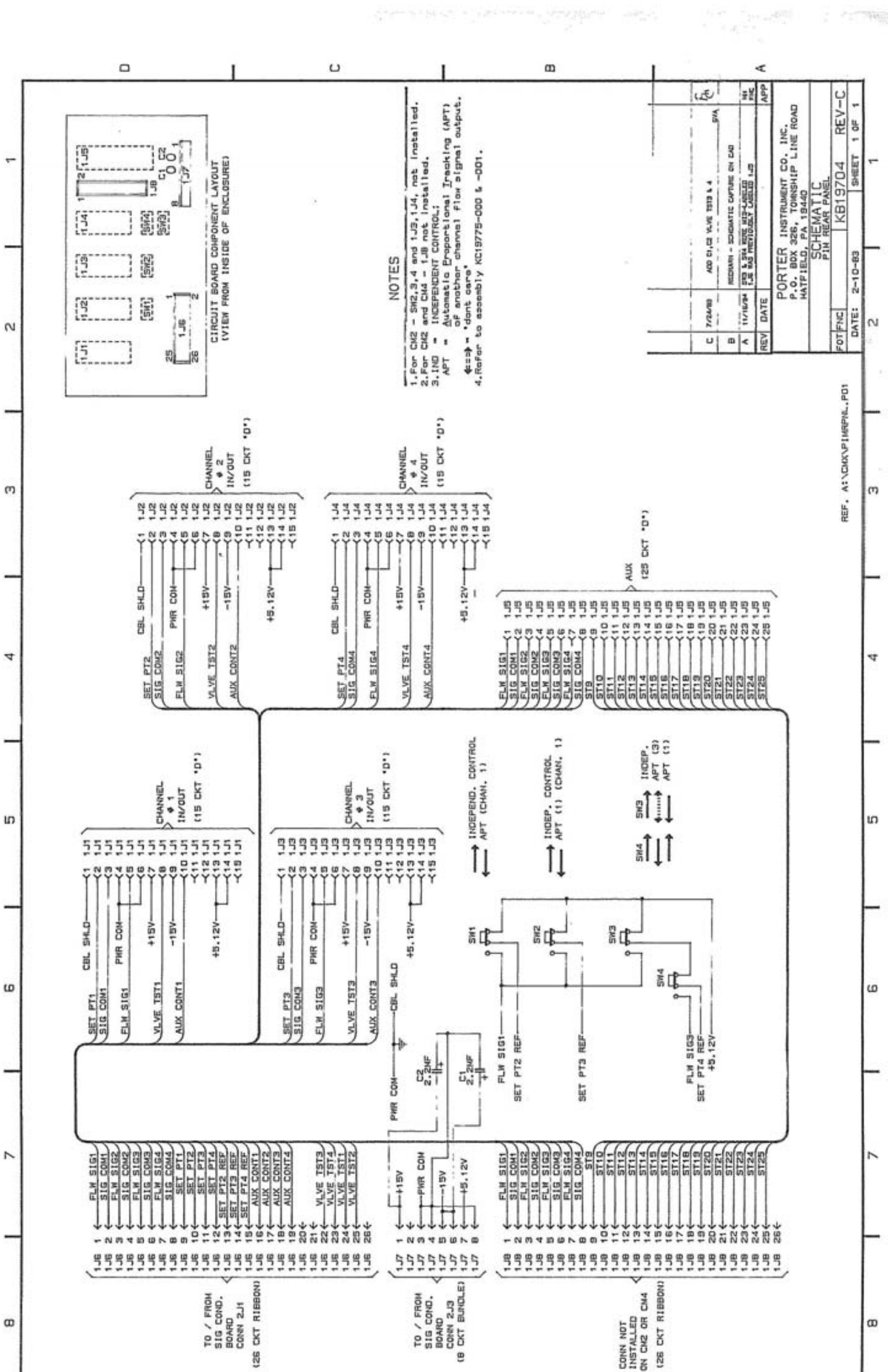
TOLERANCE SPECIFICATIONS
UNLESS OTHERWISE NOTED:
1. DECIMAL .XXX .... ±.005
2. DECIMAL .XX .... ±.02
3. ANGLES .... ±2°
4. ALL DIA CONCENTRIC WITHIN .005 T.I.R.
5. 63 RMS FINISH ALL SURFACES
6. BREAK ALL CORNERS .005/.025 X 45°
7. ALL INSIDE CORNERS .005/.025 X R.
8. REMOVE ALL BURRS & SHARP EDGES

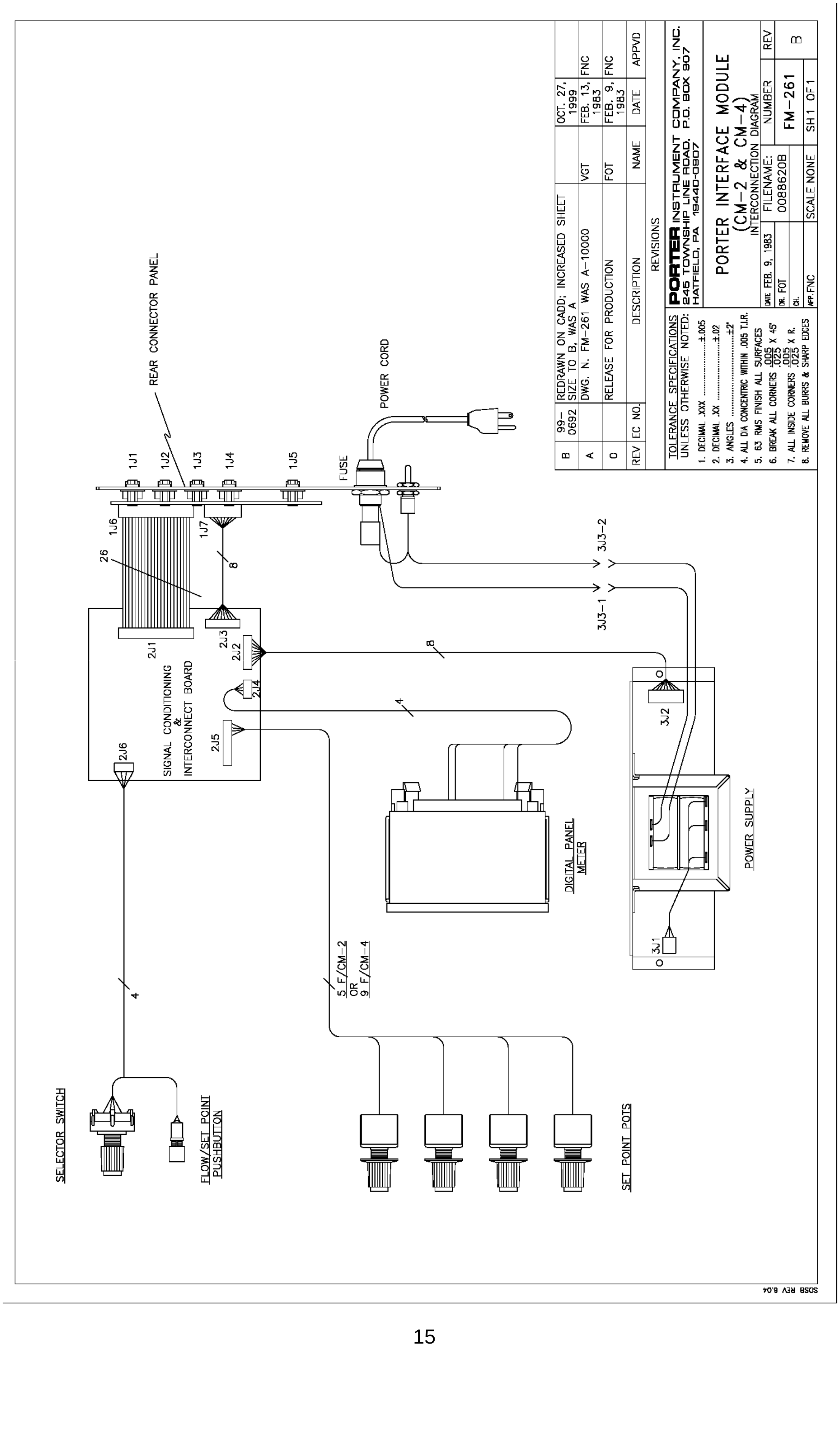
PORTER INSTRUMENT COMPANY, INC.
245 TOWNSHIP LINE RD, P.O. BOX 907
HATFIELD, PA 19440-0907, USA

P.C. BOARD ASSEMBLY
POWER SUPPLY

DATE NOV. 28, 1988	FILENAME:	NUMBER	REV
DR. GREGG V.A.	0083520G	KB20001	G
CH. NNW			
APP. FNC	SCALE 2=1	SH 1 OF 2	


NOTES -
1. REFER TO ASSEMBLY DWG # KC19770-000
2. SETPOINT CONTROLS SHOWN FOR CM4.
FOR CM2 ONLY SP1 AND SP2 EXIST.
ASSY - KC19770-000
REF ONLY - COMPONENTS FRONT PANEL MOUNTED
SELECT & MODE SWITCHES
SETPOINT CONTROLS
C 92572 U2 PIN 9 CONNECTED TO GROUND WAS CONNECTED TO MSEL C OCT. 29. 1992
B - REDRAWN. CAD 9/88 fnc
A - UPDATE TO PIN DESIG
REV EC NO. DESCRIPTION DATE APP
PORTER INSTRUMENT COMPANY, INC.
245 TOWNSHIP LINE ROAD, PO BOX 907
HATFIELD, PA 19440-0907
INTERCONNECT AND SIGNAL CONDITIONING SCHEMATIC (CM2/CM4)
DR. FNC
APP.
DATE: 9/88
KB19705
REV- C
SHEET 1 OF 1
FILENAME: 0023600C.P01


NOTES
PORTER INSTRUMENT CO. INC.
SCHEMATIC
KB19704
REV-C



REAR CONNECTOR PANEL
1J1
1J2
1J3
1J4
1J5
FUSE
POWER CORD
1J6
1J7
26
8
2J1
2J3
2J2
2J4
2J5
2J6
SIGNAL CONDITIONING & INTERCONNECT BOARD
3J3-1
3J3-2
8
4
3J2
3J1
DIGITAL PANEL METER
POWER SUPPLY
4
5 F/CM-2 OR 9 F/CM-4
SELECTOR SWITCH
FLOW/SET POINT PUSHBUTTON
SET POINT POTS
B 99-0692 REDRAWN ON CADD; INCREASED SHEET SIZE TO B, WAS A OCT. 27, 1999
A DWG. N. FM-261 WAS A-10000 VGT FEB. 13, 1983 FNC
0 RELEASE FOR PRODUCTION FOT FEB. 9, 1983 FNC
REV EC NO. DESCRIPTION NAME DATE APPVD
REVISIONS
TOLERANCE SPECIFICATIONS UNLESS OTHERWISE NOTED:
1. DECIMAL .XXX ±.005
2. DECIMAL .XX ±.02
3. ANGLES ±2°
4. ALL DIA CONCENTRIC WITHIN .005 T.I.R.
5. 63 RMS FINISH ALL SURFACES
6. BREAK ALL CORNERS .005/.025 X 45°
7. ALL INSIDE CORNERS .005/.025 X R.
8. REMOVE ALL BURRS & SHARP EDGES
PORTER INSTRUMENT COMPANY, INC.
245 TOWNSHIP LINE ROAD, P.O. BOX 907
HATFIELD, PA 19440-0907
PORTER INTERFACE MODULE (CM-2 & CM-4)
INTERCONNECTION DIAGRAM
DATE FEB. 9, 1983
DR. FOT
CH.
APP. FNC
FILENAME: 0088620B
NUMBER FM-261
REV B
SCALE NONE
SH 1 OF 1
S05B REV 6.04